



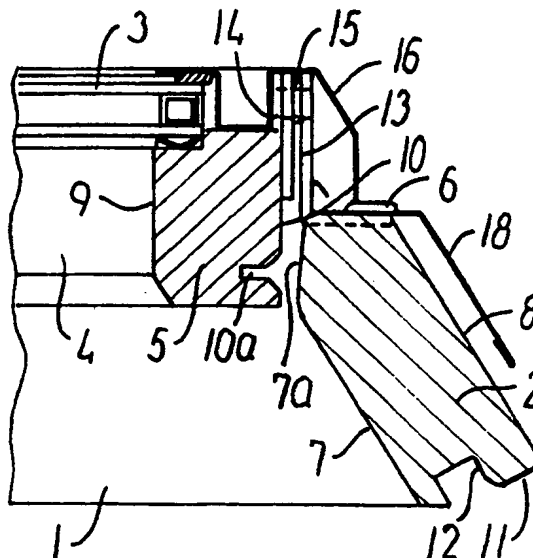
## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>6</sup> : E06B 1/32 // 3/38, E04D 13/02		A1	(11) International Publication Number: <b>WO 98/22684</b>
			(43) International Publication Date: 28 May 1998 (28.05.98)
(21) International Application Number: PCT/DK97/00520 (22) International Filing Date: 14 November 1997 (14.11.97) (30) Priority Data: 1320/96 19 November 1996 (19.11.96) DK (71) Applicant (for all designated States except US): V. KANN RASMUSSEN INDUSTRI A/S [DK/DK]; Tobaksvejen 10, DK-2860 Søborg (DK). (72) Inventor; and (75) Inventor/Applicant (for US only): CHRISTENSEN, Jan, Vilhelm [DK/DK]; Søvjevej 33, Vestbirk, DK-8752 Østbirk (DK). (74) Agents: CARLSSON, Eva et al.; International Patent-Bureau, Høje Taastrup Boulevard 23, DK-2630 Taastrup (DK).		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).  <b>Published</b> With international search report. In English translation (filed in Danish).	

(54) Title: A WINDOW, IN PARTICULAR FOR MOUNTING IN AN INCLINED ROOF SURFACE

## (57) Abstract

The sash structure of the window is hingedly connected (13-15; 51-53) with the frame structure for pivoting about a horizontal axis. The top, bottom and side members (1, 2, 4, 5; 31, 32, 34, 35) of the frame and sash structures are made from wood profiles with exterior cladding members (16-18; 46, 48) of weather-protecting material, and the top, bottom and side members (1, 2; 31, 32) of the frame structure are constituted by profiles with substantially parallelogram-shaped cross section with exterior edge faces (6; 36) positioned in a common plane, with which the adjacent opposite side faces (7, 8; 37, 38) of the profile cross section form an angle of 95 to 140°, and the exterior cladding members overlap, in the closed position of the window, the spaces between the sash and frame structure and the hinge connection between them. The window may either be a pivoting window, in which the exterior cladding members (17) above the hinge connection (13-15) are connected with the frame structure and below the hinge connection to the sash structure, or be top-hung, in which case the top, bottom and side members (34, 35) are likewise constituted by profiles with substantially parallelogram-shaped cross section.



**FOR THE PURPOSES OF INFORMATION ONLY**

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Larvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece	ML	Mali	TR	Turkey
BG	Bulgaria	HU	Hungary	MN	Mongolia	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MR	Mauritania	UA	Ukraine
BR	Brazil	IL	Israel	MW	Malawi	UG	Uganda
BY	Belarus	IS	Iceland	MX	Mexico	US	United States of America
CA	Canada	IT	Italy	NE	Niger	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NL	Netherlands	VN	Viet Nam
CG	Congo	KE	Kenya	NO	Norway	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NZ	New Zealand	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	PL	Poland		
CM	Cameroon	KR	Republic of Korea	PT	Portugal		
CN	China	KZ	Kazakstan	RO	Romania		
CU	Cuba	LC	Saint Lucia	RU	Russian Federation		
CZ	Czech Republic	LI	Liechtenstein	SD	Sudan		
DE	Germany	LK	Sri Lanka	SE	Sweden		
DK	Denmark	LR	Liberia	SG	Singapore		
EE	Estonia						

A WINDOW, IN PARTICULAR FOR MOUNTING IN AN INCLINED  
ROOF SURFACE

The present invention relates to a window, in particular for mounting in an inclined roof surface, comprising a frame structure and a sash structure, which is hingedly connected with the frame structure for pivoting about a horizontal axis relative thereto, and in which an insulating pane is mounted, the top, bottom and side members of the frame and sash structures being made from wood profiles with exterior cladding members of weather-protecting material which, in the closed position of the window, overlap the spaces between the frame and sash structures and the hinge connection between the structures.

Windows, in which the frame and the sash are composed by wood profiles and exterior cladding members for protection thereof, are well-known, i.a. from US-A-4,972,638, and are widely used because they are maintenance-free on account of the good weather-protection and their appearance which is both from the outside and from the inside attractive from an aesthetic point of view.

In particular the desire to protect the wood profiles against weather influence has in the prior art occasioned complicated and expensive solutions.

The object of the invention is to provide a window of the type mentioned by way of introduction, which apart from considering the demands made in respect of weather-protection is of a simple construction, which at the same time gives a high degree of utilization of the materials used.

This object is met according to the invention by a window, which is characterized in that the top, bottom and side members of the frame structure are

constituted by profiles with substantially parallelo-  
gram-shaped cross section with exterior edge faces  
situated in a common plane, with which the adjacent  
opposite side faces of the profile cross section form  
5 an angle of 95 to 140°.

This embodiment provides the desired simple  
construction and good protection of the interior parts  
of the window. Furthermore, the parallelogram-shaped  
cross section gives a bigger stability in the corners  
10 of the frame structure compared to a rectangular cross  
section of the same area, which makes it possible to  
manufacture the members of the frame structure with  
comparatively smaller dimensions. Furthermore, the  
parallelogram-shaped design of the wood profiles of the  
15 frame structure provides an increased total light  
incidence in relation to a window, in which the side  
faces of the frame structure extend perpendicularly to  
the sash plane. Finally, the advantage is obtained that  
exchange of accessories, like roller blinds and insect  
20 nets, is simplified, as the very access to the window  
is facilitated by the oblique interior sides of the  
frame structure.

The pivot axis of the sash structure is in an  
embodiment positioned substantially in the middle of  
25 the window for providing a pivoting window, and the  
exterior cladding members above the hinge connection  
are connected with the frame structure and, below the  
hinge connection, with the sash structure. By this  
position of the exterior cladding members, a good  
30 protection is achieved without impeding the pivoting  
movement of the window.

In a further development which is simple in  
respect of manufacture the hinge connection comprises  
two hinges positioned opposite one another at the side  
35 members of the frame and sash structures, each hinge

comprising two hinge parts, one of which is fastened to said exterior edge face of the side members of the frame structure, whereas the other one is fastened to an adjacent side edge face of the side members of the sash structure.

In an alternative embodiment the sash structure is top-hung relative to the frame structure and its top, bottom and side members are constituted by profiles with substantially parallelogram-shaped cross section.

10 The interior side faces of the sash profiles may flush with the interior side faces of the profile cross section of the top, bottom and side members of the frame structure.

In a further development of this embodiment the hinge connection between the sash and frame structures is constituted by a V-shaped hook member with a downwards facing opening on a cladding member connected with the top member of the sash structure, and a projecting wall portion engaging said hook member of an angled fitting which is fastened to the top member of the frame structure.

With a view to obtaining a simplified mounting and dismounting of the window, while at the same time securing a retaining of the sash structure to the frame in the normal opening angle range of the sash, holding means are fastened to at least one adjacent pair of the side members of the frame and sash structure, which holding means, within a predetermined opening angle range for the sash structure calculated from the closing position, hold the V-shaped hook member and said projecting wall portion in mutual engagement, but which by turning of the sash structure beyond said opening angle range allow dismounting of the sash structure relative to the frame structure.

35 The invention will now be explained in detail in

the following with reference to some exemplifying embodiments as shown in the accompanying drawings, in which

Fig. 1 is a sectional view through the lower  
5 portion of the side members of the frame and sash structures in a window, which is hinged about its centre axis,

Fig. 2 a similar view through the upper portion of the window in Fig. 1,

10 Fig. 3 shows in an alternative embodiment a sectional view through the side members of the frame and sash structures of a top-hung window according to the invention,

Fig. 4 is a sectional view through the top members  
15 of the window in Fig. 3, and

Fig. 5 shows a detail of the embodiment shown in Figs 3 and 4.

In the embodiment shown in Figs 1 and 2 of the drawings a roof or skylight window comprises according  
20 to the invention a frame structure with a top member 1, side members 2 and a bottom member not shown and a relative thereto openable sash structure, in which an insulating pane 3 is framed between a top member 4, side members 5 and a bottom member not shown. The top,  
25 bottom and side members of the frame and sash structures are all designed as wood profiles.

The frame wood profiles are made with a substantially parallelogram-shaped cross section, in which the exterior edge faces 6 of the profiles are positioned in  
30 a common plane, with which the adjacent opposite side faces 7 and 8 of the profile cross section form an angle of for instance 95 to 140°. This profile cross section, which gives the structure the shape of a low frustum of a pyramid, provides an advantageous possi-  
35 bility of making frame structures with oblique interior

sides, which is desirable on account of the mounting of various types of accessories, like for instance roller blinds and insect nets, and a minimum consumption of material. The sash wood profiles are, however, made in a traditional manner with a rectangular cross section with parallel side faces 9 and 10.

In the embodiment shown the interior side face 7 is, however, bevelled to form an edge face 7a substantially perpendicular to the exterior edge face 6, said edge face 7a facing the exterior side face 10 of the sash side member and serving as abutment face for a sealing not shown, which is secured in an oppositely positioned groove 10a. The bottom face 11 is likewise bevelled, for instance for reasons of mounting, and comprises in view of the mounting a groove 12 for receiving a tongue for the formation of a tongue-and-groove joint with a subjacent roof structure or connection with a lining.

The sash structure is hingedly connected with the frame structure by means of a hinge with two hinge members, one of which is a substantially L-shaped bracket 13 fastened to the exterior edge face 6 of the frame side member 2, and the other one is a plate 14 secured to the exterior side face 10 of the sash side member 5. The bracket 13 and the plate 14 are connected with each other through a pin 15 effecting the hinge connection between sash and frame.

With a view to protecting the interior parts of the window exterior cladding members have been mounted, the cladding members 16 below the window as shown in Fig. 1 being mounted on the sash structure and the cladding members 17 above the hinge as shown in Fig. 2 being mounted on the frame structure. This makes it possible to unimpededly pivot the lower portion of the sash outwards and the upper portion inwards during

opening of the window. Furthermore, cladding members 18 may be secured to the frame for protection of said frame, and below said cladding members a flashing known per se is passed upwards with a view to a weatherproof connection between the window and the surrounding roofing material.

In Figs 3 and 4 an alternative embodiment is shown, in which the sash structure is top-hung relative to the frame structure. When describing parts with identical or analogous function, 30 has been added to the reference numbers used in connection with the description of the embodiment shown in Figs 1 and 2.

The top member 34, side members 35 and bottom member (not shown) of the sash structure are here made as profiles with substantially parallelogram-shaped cross section, the interior side faces 39 of which are flushing with the interior side faces 37 of the frame profiles. The sealing between the sash and the frame is established by means of a circumferential sealant strip 50 fastened to the edge groove 36 of the sash profiles.

The exterior cladding members 46 are made as substantially L-shaped members which are secured to the upper side of the sash structure and extend in parallel with the exterior side faces 40 of the sash profiles, said cladding members sealing against the sealant strip 50 and overlapping the interspace between sash and frame and extending somewhat beyond the exterior side faces 38 of the frame profiles, a cladding member 48 being provided for further protection of the frame.

The sash and frame structures shown make it in an advantageous manner possible to make the top hinge of the window integral with the top members 31 and 34 of the frame and sash structures, respectively.

To this end a fitting member 51 with a pivot-forming part in the form of a projecting wall portion



52 may be connected with the cladding member 48 for the frame top member 31, whereas a substantially V-shaped hook member 53 is integral with the L-shaped cladding member 46 for the sash top member, said hook member 5 being hitched on the projecting wall portion 52 and having an opening angle in the range of 20 to 30°.

To keep the hook member 53 and the projecting wall portion 52 in mutual engagement and to make a turning of the sash structure possible into a ventilating position, holding means, for instance in the form of blocks 54 and 55 of a wear-resisting plastics material, may, as shown in Fig. 5, be fastened to adjacent pairs of side members of the frame and sash structures with part-cylindrical guide surfaces 56 and 57 with axis in the pivot axis 58 of the hinge. Within an opening angle range which is smaller than the opening angle of the V-shaped hook member, the holding means will keep the hinge parts in mutual engagement, while they, by turning of the sash structure beyond this opening angle range to the position shown in dashed line in Fig. 5, will disengage and thus allow an easy dismounting of the sash structure relative to the frame structure.

## P A T E N T   C L A I M S

1. A window, in particular for mounting in an inclined roof surface, comprising a frame structure and a sash structure, which is hingedly connected (13-5 15;51-53) with the frame structure for pivoting about a horizontal axis relative thereto, and in which an insulating pane (3;33) is mounted, the top, bottom and side members (1,2,4,5;31,32,34,35) of the frame and sash structures being made from wood profiles with 10 exterior cladding members (16-18;46,48) of weather-protecting material which, in the closed position of the window, overlap the spaces between the frame and sash structures and the hinge connection between the structures, c h a r a c t e r i z e d in that the top, 15 bottom and side members (1,2;31,32) of the frame structure are constituted by profiles with substantially parallelogram-shaped cross section with exterior edge faces (6;36) postioned in a common plane, with which the adjacent opposite side faces (7,8;37,38) of 20 the profile cross section form an angle of 95 to 140°.

2. A window according to claim 1, c h a r a c - t e r i z e d in that the pivot axis is positioned substantially in the middle of the window for providing a pivoting window, and in that the exterior cladding 25 members (17) above the hinge connection (13-15) are connected with the frame structure and below the hinge connection with the sash structure.

3. A window according to claim 2, c h a r a c - t e r i z e d in that the hinge connection comprises 30 two hinges positioned opposite one another at the side members (2,5) of the frame and sash structures, each hinge comprising two hinge parts, one of which (13) is fastened to said exterior edge face (6) of the side members (2) of the frame structure, whereas the other 35 one (14) is fastened to an adjacent side edge face (10)

of the side members (5) of the sash structure.

4. A window according to claim 1, c h a r a c -  
t e r i z e d in that the sash structure is top-hung  
relative to the frame structure, and that its top,  
5 bottom and side members (34,35) are constituted by  
profiles with substantially parallelogram-shaped cross  
section.

5. A window according to claim 4, c h a r a c -  
t e r i z e d in that the interior side faces (39) of  
10 the cross section of the sash profiles are flush with  
the interior side faces (37) of the profile cross  
section of the top, bottom and side members of the  
frame structure.

6. A window according to claim 4 or 5, c h a r -  
15 a c t e r i z e d in that the hinge connection between  
the sash and frame structures is constituted by a V-  
shaped hook member (53) with a downwards facing opening  
on a cladding member (46) connected with the top member  
(34) of the sash structure, and a projecting wall  
20 portion (52), engaging said hook member (53), of an  
angled fitting (51) which is fastened to the top member  
(31) of the frame structure.

7. A window according to claim 6, c h a r a c -  
t e r i z e d in that to at least one adjacent pair of  
25 the side members (32,35) of the frame and sash struc-  
tures holdings means (54,55) are fastened, which,  
within a predetermined opening angle range for the sash  
structure calculated from the closing position, hold  
the V-shaped hook member (53) and said projecting wall  
30 portion (52) in mutual engagement, but which by turning  
of the sash structure beyond said opening angle range  
allow dismounting of the sash structure relative to the  
frame structure.

1/2

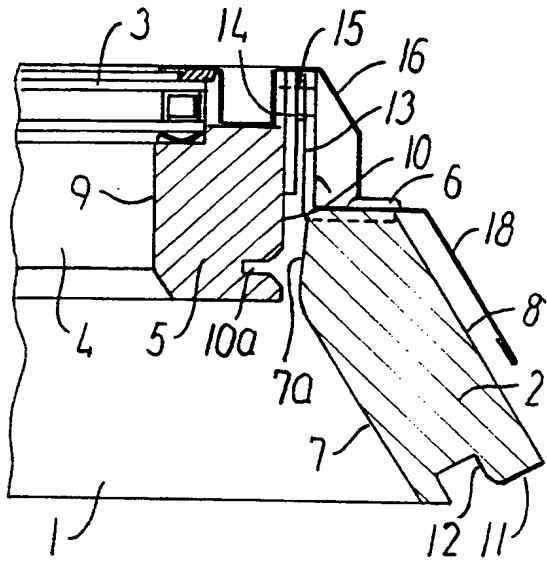


FIG. 1

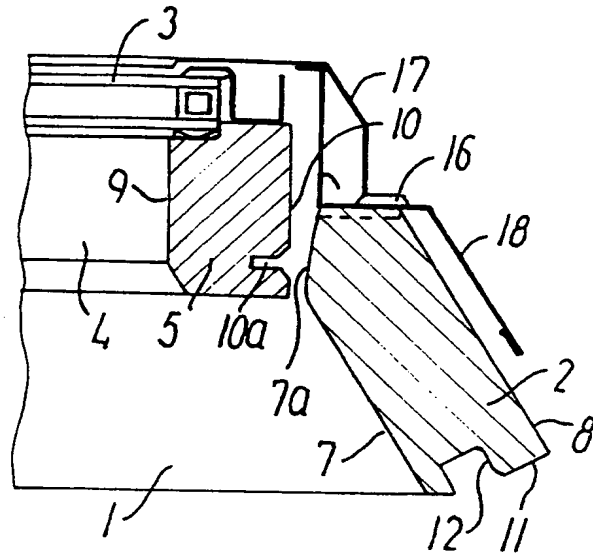


FIG. 2

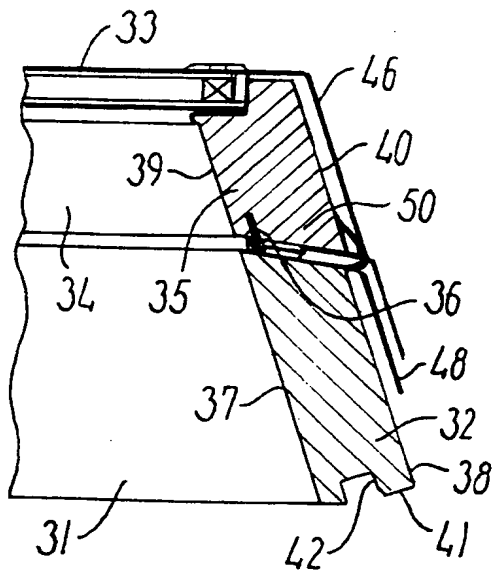


FIG. 3

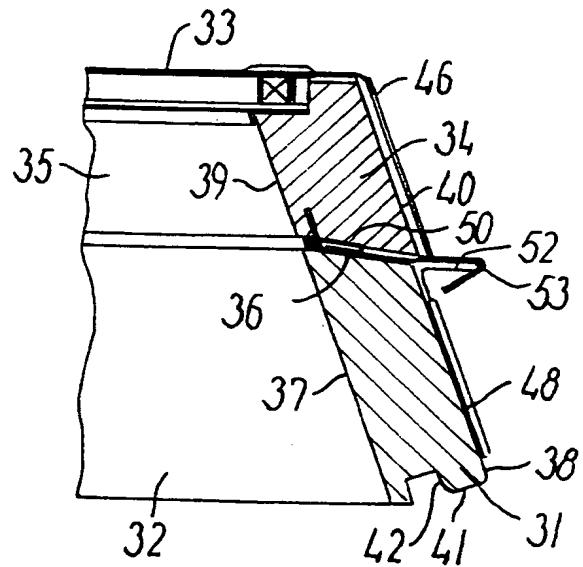


FIG. 4

2/2

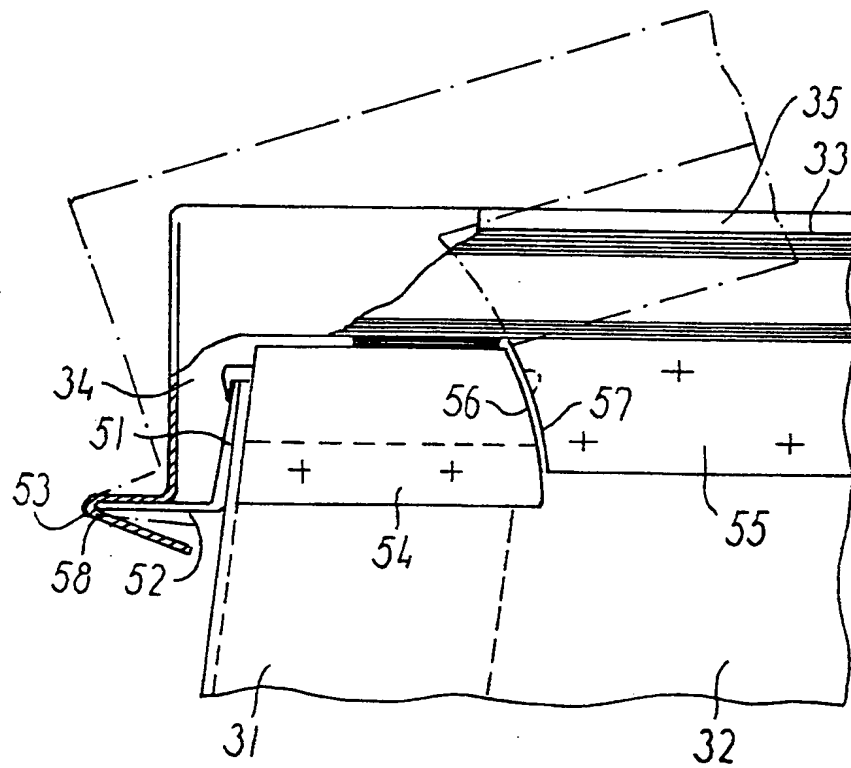


FIG. 5

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/DK 97/00520

## A. CLASSIFICATION OF SUBJECT MATTER

IPC6: E06B 1/32 // E06B 3/38, E04D 13/02

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: E06B, E04D, E04B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4776141 A (J.W. POWELL), 11 October 1988 (11.10.88)  --	1-7
A	US 4972638 A (M. MINTER), 27 November 1990 (27.11.90)  --	1-7
A	FR 2700793 A1 (LAHERA PRODUCTIONS), 29 July 1994 (29.07.94)  -- -----	1-7

☐ Further documents are listed in the continuation of Box C.
 ☒ See patent family annex.

## \* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&amp;" document member of the same patent family

Date of the actual completion of the international search

Date of mailing of the international search report

10 February 1998

13 -02- 1998

 Name and mailing address of the ISA/  
 Swedish Patent Office  
 Box 5055, S-102 42 STOCKHOLM

Authorized officer

Johan Winther

**INTERNATIONAL SEARCH REPORT**

Information on patent family members

03/02/98

International application No.

PCT/DK 97/00520

Patent document cited in search report			Publication date	Patent family member(s)	Publication date
US	4776141	A	11/10/88	NONE	
US	4972638	A	27/11/90	CA 2008724 A,C	21/10/90
FR	2700793	A1	29/07/94	NONE	